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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference HJ/FI990730	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FI00/00264	International filing date (<i>day/month/year</i>) 29.03.2000	Priority date (<i>day/month/year</i>) 01.04.1999
International Patent Classification (IPC) or national classification and IPC ₇ B63B 25/24		
Applicant Finnlines OYJ et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 18.08.2000	Date of completion of this report 20.06.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Telex Box 5055 17978 S-102 42 STOCKHOLM PATOREG-S Facsimile No. 08-667 72 88	Authorized officer Björn Salén/js Telephone No. 08-782 25 00

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00264

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement) under article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00264

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**I. Statement**

Novelty (N)	Claims	<u>1-15</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-15</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-15</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

D1: US 4 294 185
D2: US 4 497 271
D3: US 3 776 169
D4: US 3 603 544
D5: WO 9 730 890

The claimed invention relates to a method and a device for securing horizontally loaded cargo units on a vessel. The cargo units are handled and secured for transporting the cargo units on the vessel. The cargo unit is secured to the vessel and/or to an adjacent cargo unit by means of securing elements forming an interlocking coupling. Furthermore, the adjacent unit is located at the longitudinal side of the cargo unit with respect to the driving direction thereof by means of securing elements placed on the vertical sides of the cargo unit. The securing element is fixed to a bulkhead of the vessel and to the cargo unit or to the adjacent cargo units. With their locking arrangement, the securing elements prevent vertical movement and form an interlocking coupling. The cargo unit is then secured and remains in place in the securing position.

D1, the closest prior art, discloses a system for securing containers in a ship's hold. At the midpoint of the length of the cell and at least one side of the cell, a flanged guide is attached to the ship's structure. The guide co-operates with two hooks, which are each detachably connected to a bottom corner piece of one of the containers at the sides.

.../...

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00264

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Box V(I)

Claims 1-15 differs from D1 in that the securing elements are located at the longitudinal side of the cargo unit with respect to the driving direction.

The invention according to claims 1-15 is thus novel and is considered to involve an inventive step and to have industrial applicability.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference HJ/FI990730	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA.220) as well as, where applicable, item 5 below.
International application No. PCT/FI 00/00264	International filing date (<i>day/month/year</i>) 29 March 2000	(Earliest) Priority Date (<i>day/month/year</i>) 1 April 1999
Applicant Finnlines OYJ et al		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (See Box I).
2. ☐ Unity of invention is lacking (See Box II).
3. ☐ The international application contains disclosure of a **nucleotide and/or amino acid sequence listing** and the international search was carried out on the basis of the sequence listing

☐ filed with the international application.
☐ furnished by the applicant separately from the international application,

☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.

☐ transcribed by this Authority.
4. With regard to the title, ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:
5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. The figure of the drawings to be published with the abstract is:
 Figure No. 1A

☒ as suggested by the applicant.

☐ None of the figures.

☐ because the applicant failed to suggest a figure.
☐ because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

1

International application No.

PCT/FI 00/00264

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B63B 25/24

According to International Patent Classification (IPC) or to both national classification and IPC:

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4294185 A (NORDSTROM ET AL), 13 October 1981 (13.10.81) --	1-15
A	US 4497271 A (GLOYSTEIN), 5 February 1985 (05.02.85) --	1-15
A	US 3776169 A (STRECKER), 4 December 1973 (04.12.73) --	1-15
A	US 3603544 A (GRIFFITH), 7 Sept 1971 (07.09.71) --	1-15

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

1 August 2000

Date of mailing of the international search report

08 -08- 2000

Name and mailing address of the ISA
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Christer Jönsson/LR
Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 00/00264

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9730890 A1 (JOHANSSON), 28 August 1997 (28.08.97) ----- -----	1-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

02/12/99

International application No.

PCT/FI 00/00264

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
US	4294185	A	13/10/81	NONE	
US	4497271	A	05/02/85	NONE	
US	3776169	A	04/12/73	NONE	
US	3603544	A	07/09/71	DE 1756680 A,B,C FR 1580341 A GB 1228013 A NL 165984 B,C NL 6809031 A SE 334294 B	30/04/70 05/09/69 15/04/71 15/01/81 27/12/68 19/04/71
WO	9730890	A1	28/08/97	AU 2238197 A AU 5785796 A EP 0825954 A EP 0880451 A SE 509258 C SE 9600632 A	10/09/97 29/11/96 04/03/98 02/12/98 21/12/98 21/08/97

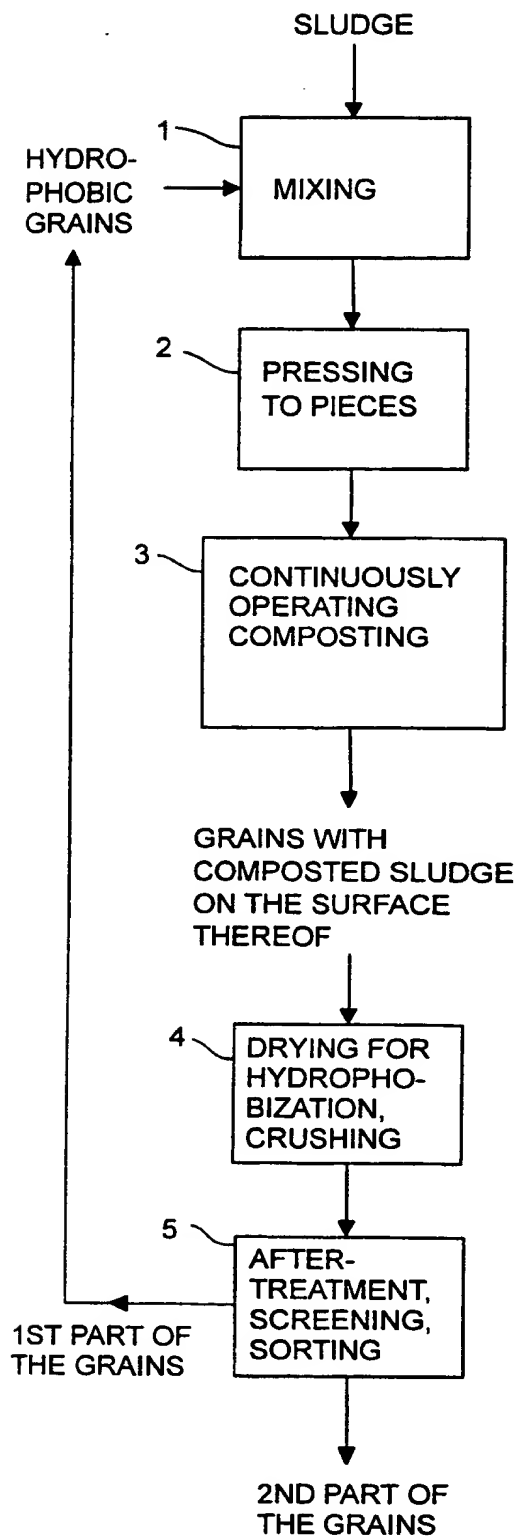


Fig. 1

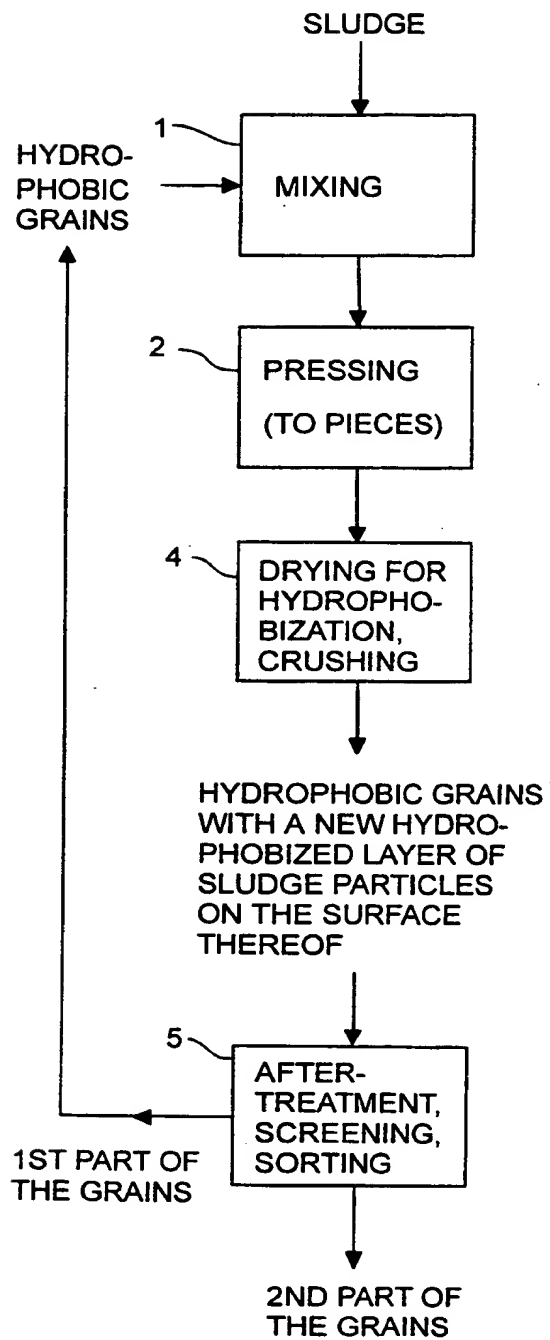


Fig. 2

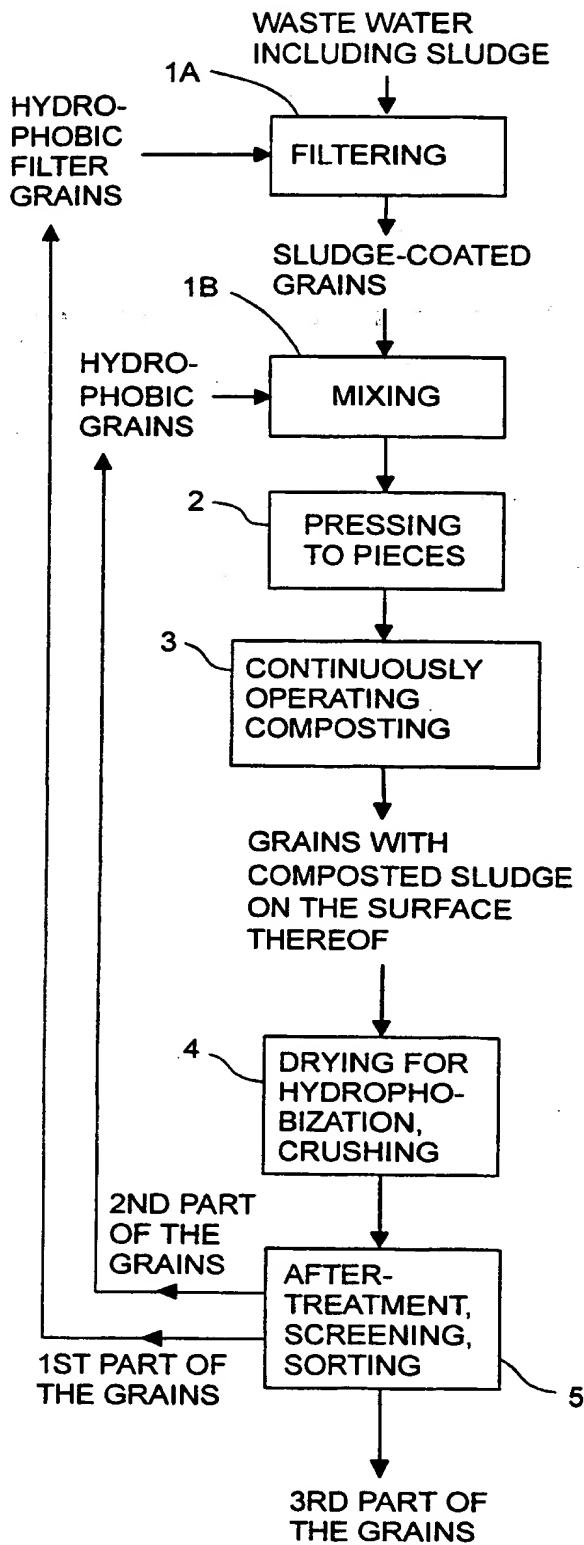


Fig. 3

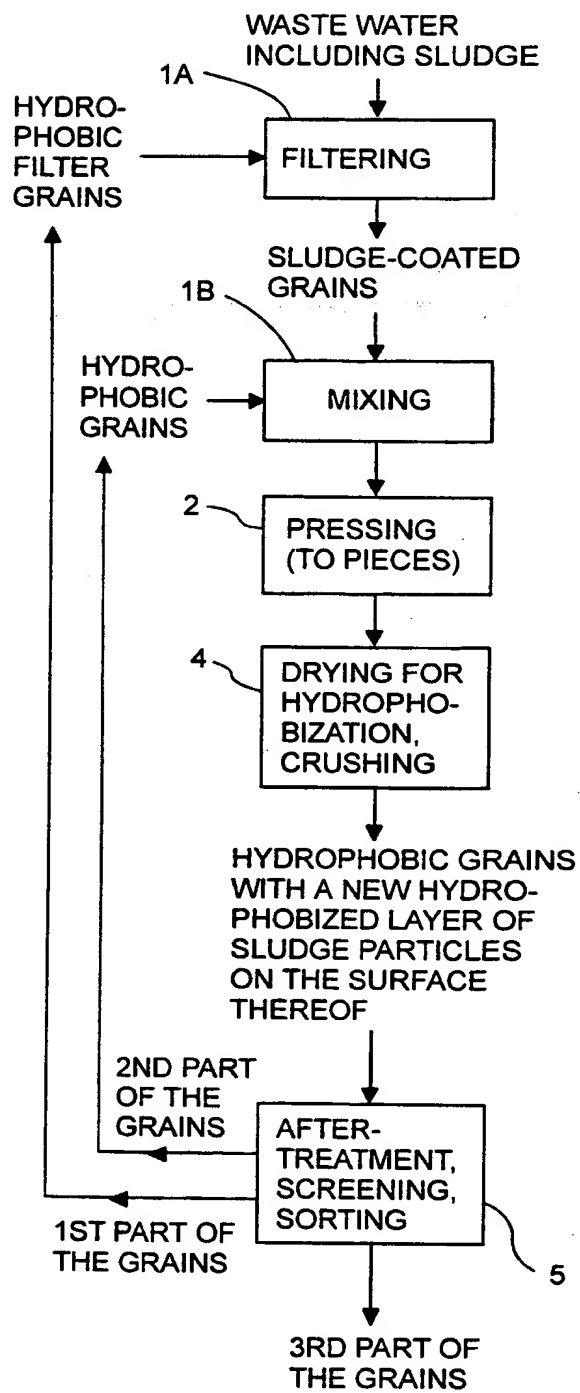


Fig. 4

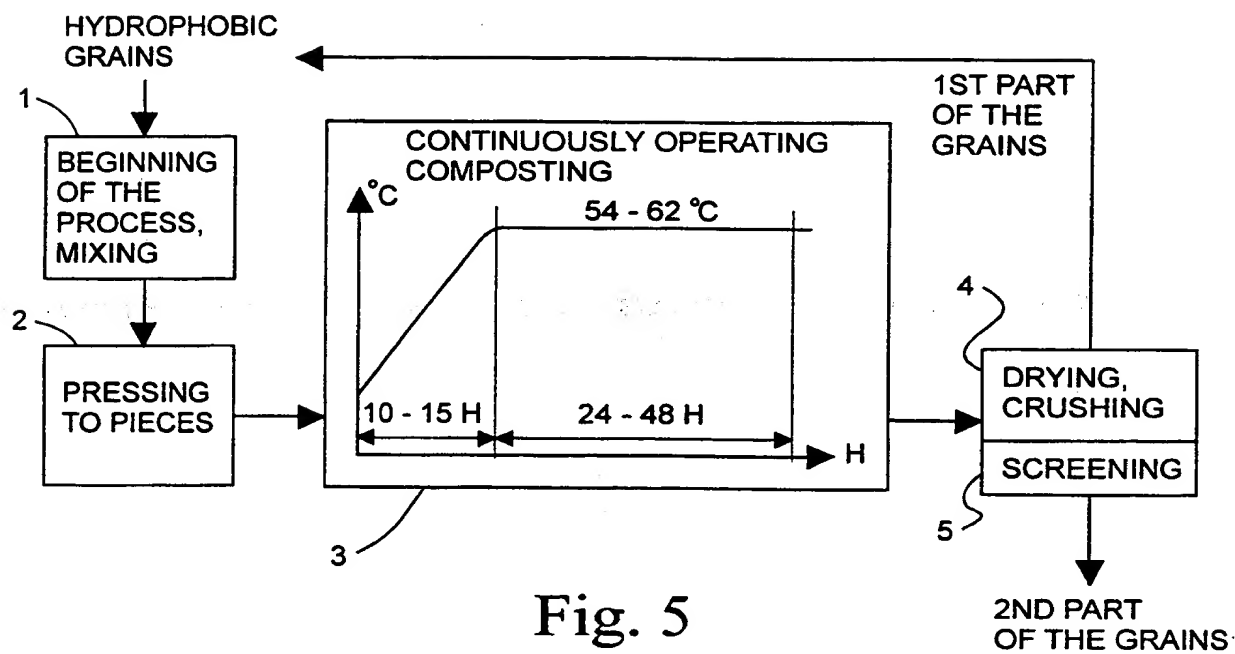


Fig. 5

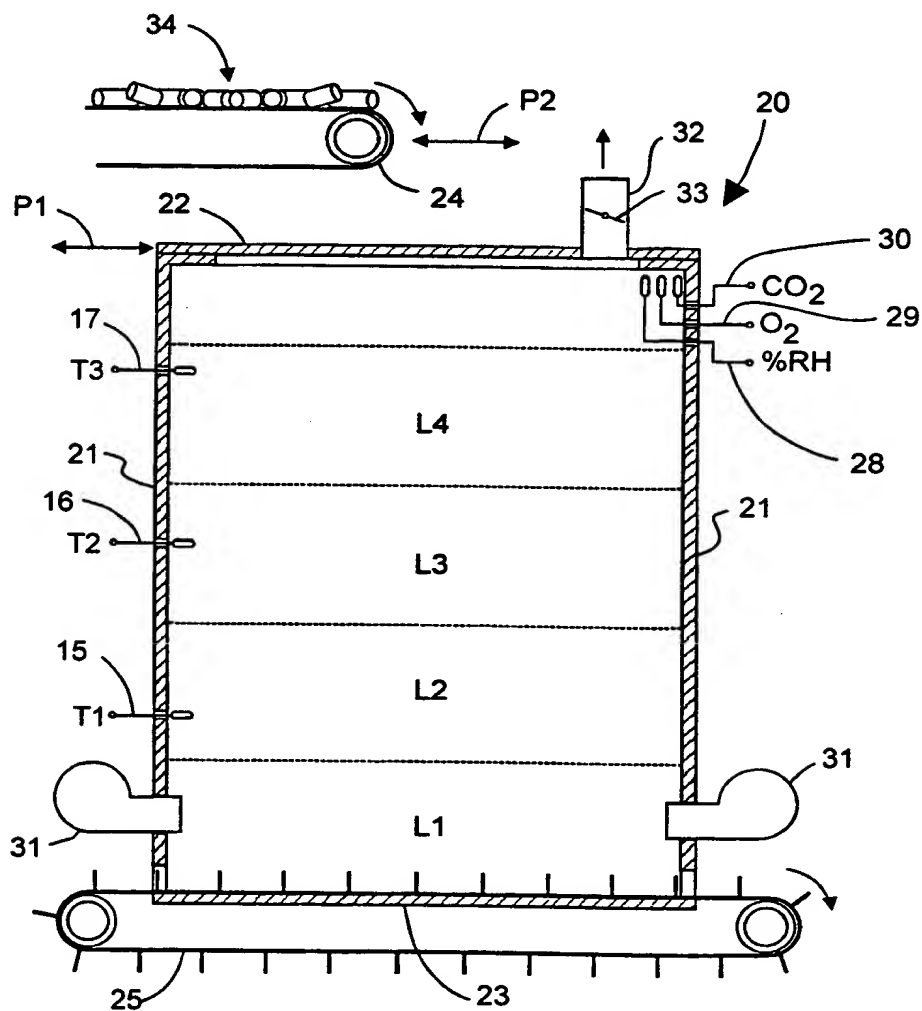


Fig. 6

4/7

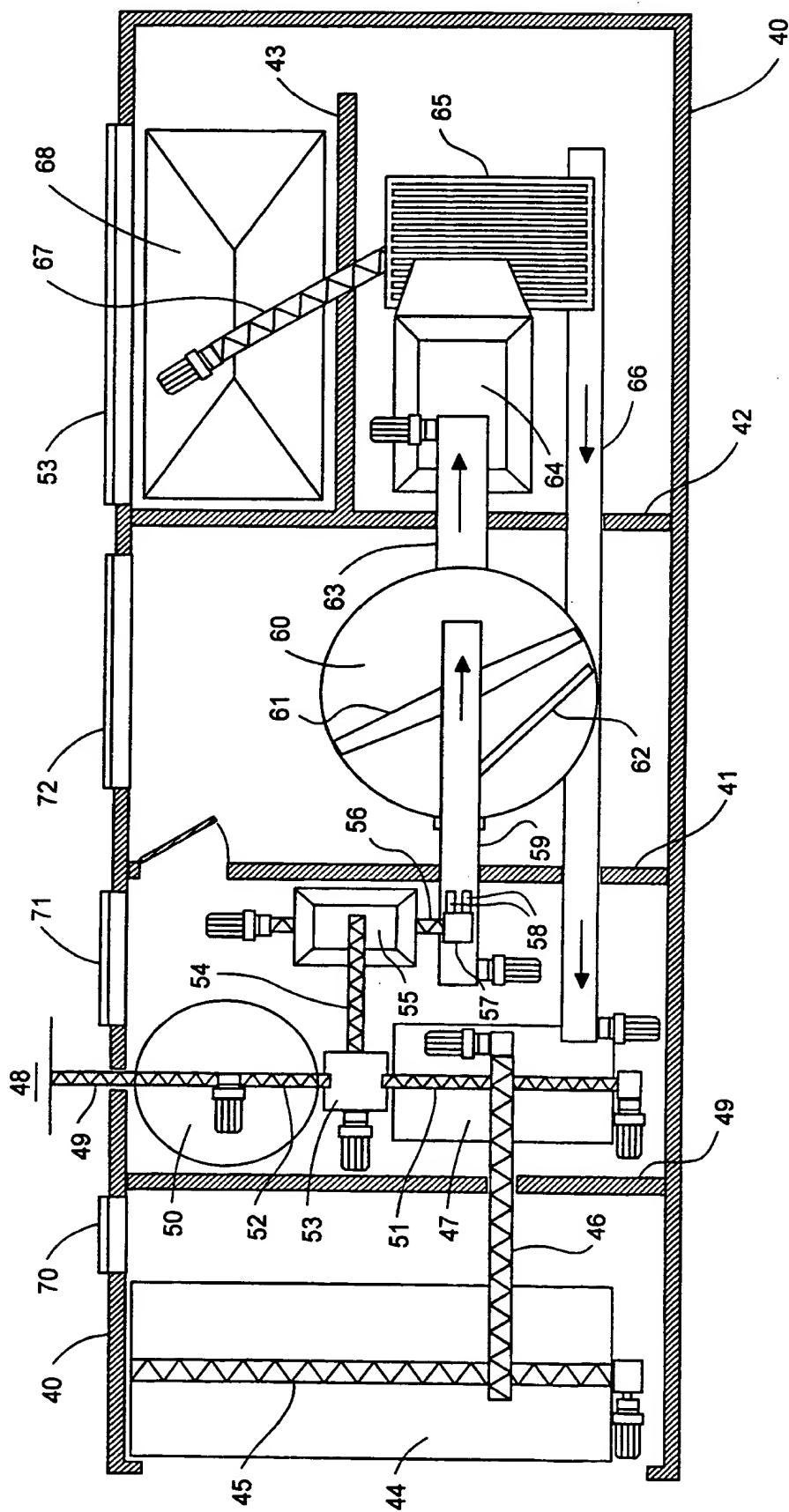


Fig. 7

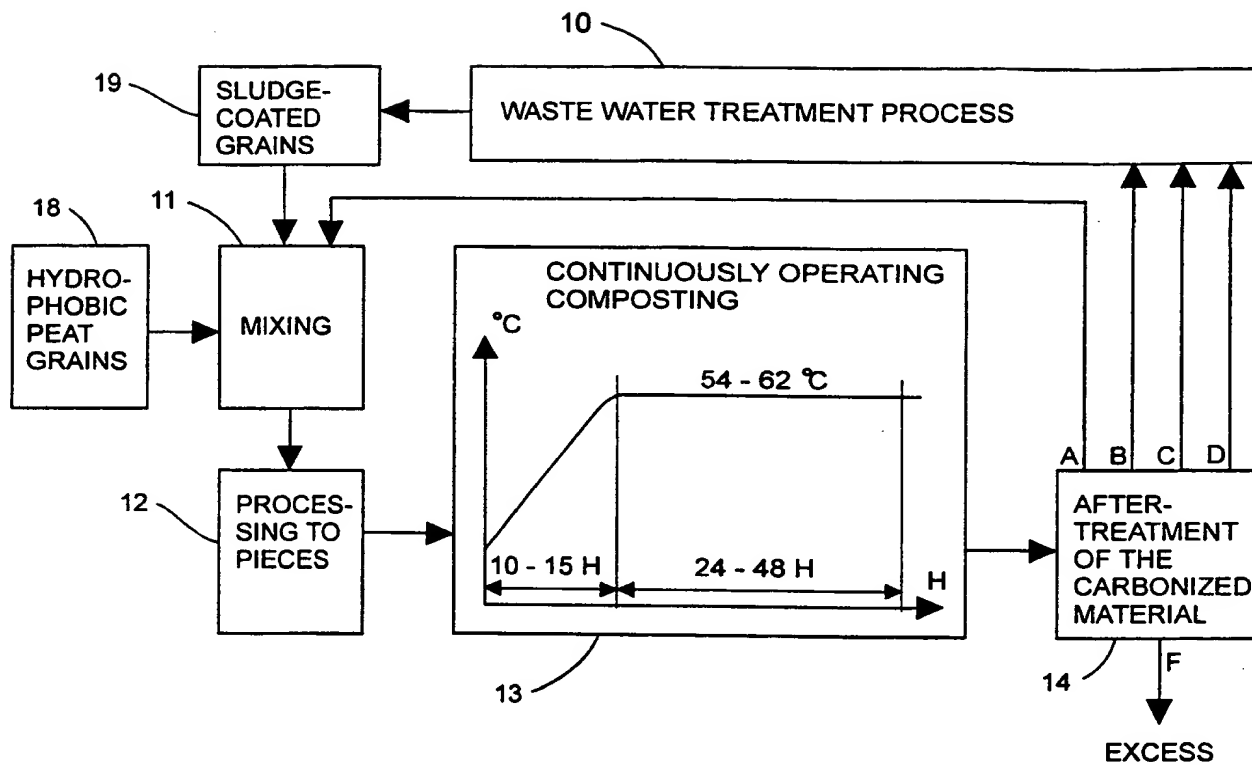


Fig. 8

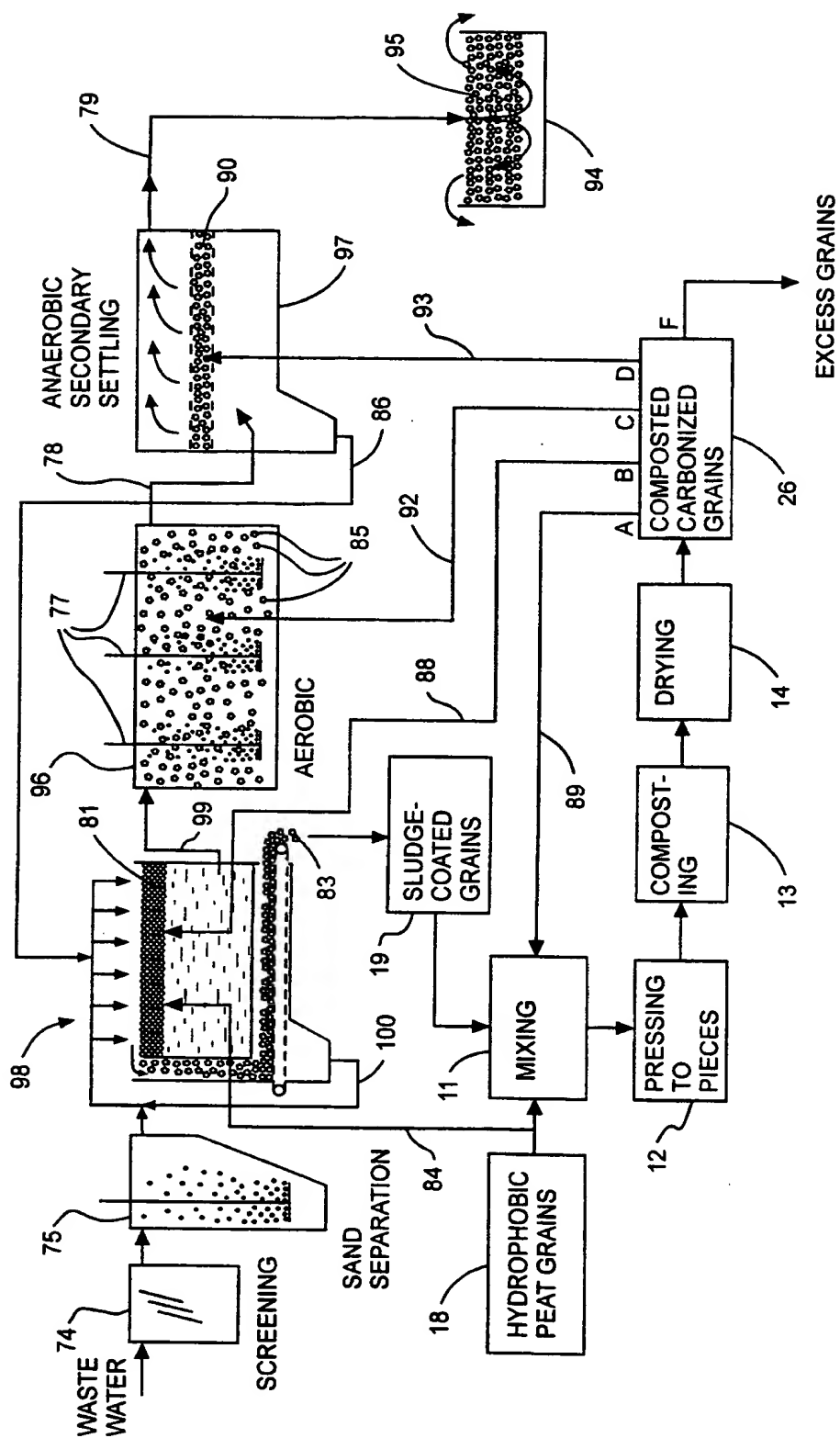


Fig. 9

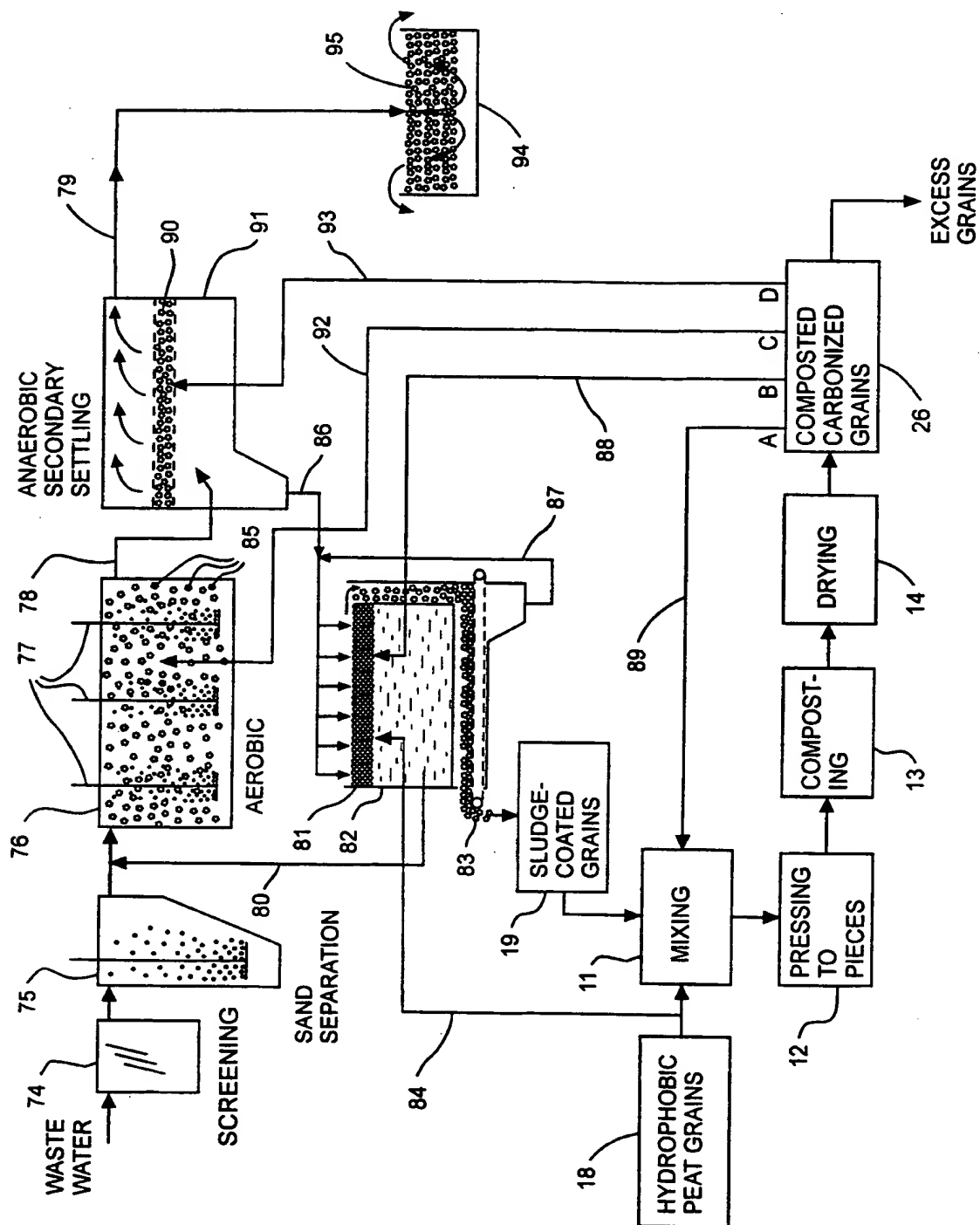


Fig. 10

09 1.937.970

PATENT COOPERATION TREATY

REC'D 16 AUG 2001

PCT

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PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

3612

Applicant's or agent's file reference 0040wo	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FI00/00262	International filing date (day month year) 29.03.2000	Priority date (day month year) 29.03.1999
International Patent Classification (IPC) or national classification and IPC7 C02F 11/12		
Applicant ETOR OY et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 23.10.2000	Date of completion of this report 06.08.2001
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Lars Ekeberg/js Telephone No. 08-782 25 00

Form PCT/IPEA/409 (cover sheet) (January 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00262

I. Basis of the report

1. With regard to the **elements** of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
pages 1-11, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☒ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement) under article 19
pages _____, filed with the demand
pages 13-14, filed with the letter of 23.05.2001
- ☒ the drawings:
pages 1-7, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.These elements were available or furnished to this Authority in the following language English which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00262

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-14</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-14</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-14</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

This report is based on amended claims 1-14, filed with the letter of 23.05.2001. Original claims 15-17 have been deleted.

The invention relates to a method of treating and utilising sludge, wherein, as a first stage the hydrophilic sludge particles are caused to attach to the surface of hydrophobic organic grains. In a second stage the grains thus obtained are dried, in order to turn the water-bearing layer of sludge particles on the surface hydrophobic. An essential part of the grains are then returned to the first stage.

The following documents have been cited in the International Search Report:

D1: WO 97/01513 A1

D2: US 5,611,935 A

D3: US 5,614,458 A

D4: WO 94/01369 A1

Among these, D1 is considered to the closest document. All cited documents are, however, only considered to represent the state of the prior art.

D1 has been re-evaluated since the establishment of the search report. It is no longer considered to be of particular relevance regarding claims 1-14.

D1, discloses a waste sludge treatment process, in which a solid additive that includes hydrophobic grains of peat is mixed with the sludge. The invention differs from the method described in D1 in that a portion of the grains are re-circulated, whereby the amount of grain used can be reduced drastically.

.../...

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FI00/00262

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: BOX V (I)

This difference is, despite of its simplicity, not considered to be obvious. Nowhere in D1 is it implied that the grains might be re-used in order to increase their bonding capacity. There are no suggestions in the cited documents leading a person skilled in the art towards the invention defined by claims 1-14.

Consequently, the invention according to claims 1-14 fulfils the criteria of novelty, inventive step, and industrial applicability.

Claims

1. A method of treating and utilizing sludge, **characterized** in that therein:
in a first phase (1, 1A, 1B, 2) hydrophilic water binding sludge particles are
5 caused to attach to the surface of hydrophobic organic grains, like hydrophobic grains of
peat,
in a second phase (4) the grains obtained thereby having a water-bearing layer
of sludge particles on the surface thereof are dried to hydrophobize also the surface layer,
in a third phase (5) an essential portion of the hydrophobic grains obtained
10 thereby are circulated back to said first phase of the method.
2. A method according to claim 1, **characterized** in that hydrophobic grains are circulated
in the method 5 to 10 times on an average.
- 15 3. A method according to claim 1, **characterized** in that sludge particles are in said first
phase caused to attach to the surface of hydrophobic organic grains by mixing hydrophobic
grains with sludge (1) and by extruding (2) the mixture obtained.
4. A method according to claim 1, **characterized** in that sludge particles are in said first
20 phase caused to attach to the surface of hydrophobic organic grains by filtering water
including sludge by means of the grains (1A), by mixing the sludge-coated grains with
hydrophobic organic grains according to need (1B) and by extruding (2) the mixture
obtained.
- 25 5. A method according to claim 4, **characterized** in that grains hydrophobized again by
drying are circulated back (5) to both the filtering (1A) and mixing (1B).
6. A method according to claim 1, **characterized** in that grains grown up or attached to each
other in the circulation are split to smaller ones.
- 30 7. A method according to claim 1, **characterized** in that the grains are composted (3)
between said first phase and second phase (4).
8. A method according to claim 7, **characterized** in that the mixture is composted (3) as
35 extruded to pieces in a continuously operating process in which the temperature of the

pieces is raised rapidly to the thermophilic range within which the composting is mainly carried out (Figs 5 and 8).

5 9. A method according to claim 1, **characterized** in that grains taken off from the circulation are coated.

10 10. A method according to claim 9, **characterized** in that grains taken off from the circulation are coated with one or more of the following materials: lime, ash, nutrient solution, clay, gypsum, silicon carbonate.

11. A method according to claim 1, **characterized** in that grains are coated with selected materials between cycles of circulation whereby a layer of said materials is formed in the inside of grains.

15 12. A method according to claim 11, **characterized** in that a selected material is a solution or a mass including nutrients.

20 13. A method according to claim 1, **characterized** in that substances affecting the properties of the grains are added to the sludge, the mixture of the sludge and hydrophobic grains, or the mixture of the sludge-coated grains and hydrophobic grains.

14. A method according to claim 13, **characterized** in that the added substances affect one or more of the following properties: nutrient content, solubility of nutrients, pH.



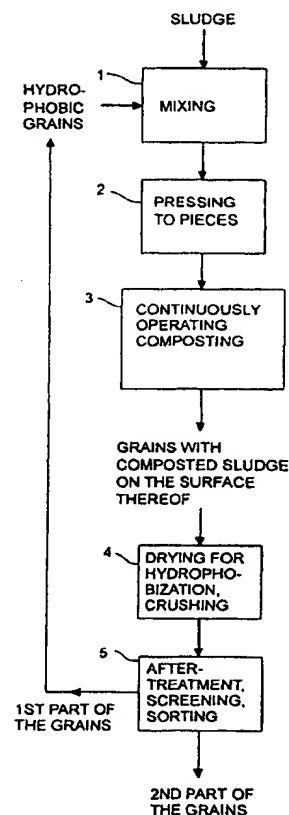
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : C02F 11/12		A1	(11) International Publication Number: WO 00/58229
			(43) International Publication Date: 5 October 2000 (05.10.00)
(21) International Application Number: PCT/FI00/00262		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 29 March 2000 (29.03.00)			
(30) Priority Data: 990696 29 March 1999 (29.03.99) FI 19992178 11 October 1999 (11.10.99) FI 19992853 31 December 1999 (31.12.99) FI			
(71) Applicant (for all designated States except US): ETOR OY [FI/FI]; Haapakuja 11 C 19, FIN-90650 Oulu (FI).			
(72) Inventor; and (75) Inventor/Applicant (for US only): TORKKELI, Esko [FI/FI]; Haapakuja 11 C 19, FIN-90650 Oulu (FI).			
(74) Agent: LAURINOLLI, Tapio; Patenttitoimisto Tapio Laurinolli, P.O. Box 258, FIN-90101 Oulu (FI).			
		<p>Published</p> <p><i>With international search report.</i></p> <p><i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p> <p><i>In English translation (filed in Finnish).</i></p>	

(54) Title: METHOD OF TREATING AND UTILIZING SLUDGE

(57) Abstract

A method of treating and utilizing sludge is characterized in that in a first phase (1, 2) sludge particles are bound to the surface of hydrophobic organic grains, like hydrophobic grains of peat, in a second phase (4) the grains obtained thereby, having a layer of sludge particles including a lot of water on the surface of hydrophobic grains, are dried to hydrophobize also the surface layer, and in a third phase (5) an essential portion of the hydrophobic grains obtained thereby are circulated back to said first phase of the method. Attachment of sludge particles to the surface of hydrophobic grains is promoted by extruding (2) the mixture of sludge and hydrophobic grains. Grains are circulated in the method 5 to 10 times, for example. The method may include a rapid continuously operating composting between said first and second phase. With the invention, very remarkable savings are achieved in raw material costs of sludge treatment. The sludge is brought to a solid and advantageous form largely by means of the solid matter and energy of the sludge itself. The invention may be utilized especially in biological treatment of waste water, manufacture of fertilizers and treatment of sludge for burning.



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